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ORIGINAL COMMUNICATIONS.

ART. I. *On those Principles of Composition, in Architecture, which are common to all the Fine Arts.* By the CONDUCTOR. Sect. 1. *Forms, Lines, Lights, Shades, and Colours, considered with reference to the Production of an Architectural Whole.*

HAVING laid down what we consider to be the fundamental principles of composition in the fine arts generally, we shall now show the manner in which they are applied in architectural composition; but always, it must be remembered, with reference to that art considered in an abstract point of view, as the art of combining artificial forms, lines, lights, shades, and colours; without reference to the uses of buildings, or to particular styles of architecture. By separating these elements of composition from the ideas of use, of expense, of propriety, of fitness, and, above all, from architectural style, we shall be the better able to analyse our ideas respecting them, and to show to the young and inexperienced student their independent influence. The principles of composition applicable to the different styles of architecture, and having reference to the use and duration of buildings, will be subsequently considered.

The first principle which we laid down (p. 217.) is that of the necessity of producing a whole, in order that the composition may be easily comprehended by the eye. The reason given for this is, the unity of the human mind, which can only properly attend to one thing at a time. Hence, as we before stated, the necessity of the unity of the whole; and of the connection between the parts, either really by absolute contiguity, or apparently by seeming contiguity. To these elements of a whole, we added that of what artists call distance, or the adjustment of a whole to the eye.

It is scarcely necessary to observe, that the parts composing every whole must either be, or seem to be, in contact with each other. This is self-evident; for, as the object, in producing a whole, is to combine several different things so as to produce the effect of one; if these different things were apart from each other, they would form several objects, instead of a single one. The adjustment of an object, or of a collection of objects, to the

human eye, is equally necessary to our comprehension of such objects as a whole. If they are too near, the limited angle of vision cannot embrace them, and they can only be seen partially, or in succession; and thus, a series of impressions will be produced, instead of a simultaneous one. If, on the other hand, they are too far from the eye, the angle of vision will not be sufficiently filled; intervening objects will enter into the picture on the retina, and the eye and the mind will be distracted. In order to facilitate the comprehension of a combination of objects as a whole, it is found advantageous, in artificial composition, to arrange them within the limits of some well-known and easily comprehended figure. Thus, a whole, however intricate and numerous may be its parts, will be much more readily comprehended if its outline assimilates easily to the form of a square, a parallelogram, a semicircle, a triangle, or any such familiar geometrical figure, than if it were really in the form of any two of these figures combined; or in a form so irregular, as not to be easily reducible in the mind, at the first glance, to any common figure. If we examine what passes in our minds when we are attending to any new object, with a view of impressing it on the memory, we shall find that, if forms be an important element in the object or scene, we compare them in the mind with other forms with which we are already familiar; and, as mankind generally are more equally acquainted with geometrical or abstract forms, than they are with the forms of particular things, hence new forms are more frequently compared to circles, squares, triangles, &c., than they are to the sun, to trees, or to the human figure. Such a lake is said to be round or oval, and not sun-shaped or egg-shaped; and such a mountain flat or conical, and so on. We state this, lest it should be thought that there is any magic in the form of a triangle, a cone, or a square, &c., as applied to groups; and to show that, in reality, these forms are merely made use of in idea, as helps to the memory. Having made these remarks on the paramount importance of the principle of a whole, we shall now proceed to show how a whole may be produced by forms, by lines, by lights and shades, and by colours respectively.

In combining *Forms* into a whole, these forms must be more or less of the same kind. If the whole consists of few parts, then little variety of form can be produced; if it consists of a great number of parts, then a variety of forms may enter into the composition. Suppose a whole to consist only of two parts. In that case, if one of the parts were a cube, and the other a globe, or a semi-globe, it is evident that a whole could not be produced; because there is no congruity between these two forms. In order to display a cube and a semi-globe in the same composition, either a number of intervening forms become requi-

site; or the one form must be incomparably smaller than the other. In general, there should be one prevailing form in every composition, or at least one prevailing character of form. Suppose what may be called the initiatory or fundamental form to be the square, or the cube; then, the parallelogram, as being of the same character, may be combined with it, so as to produce every requisite variation. The square, or cube, can only produce variation by being made larger or smaller, or by being repeated; but the parallelogram admits of being made narrower or broader at pleasure, and it farther admits of being placed either on its side or on its end. Both squares and parallelograms admit of being placed either at right angles or obliquely to each other; and this is a farther source of variation, though still perfectly consistent with the production of a whole.

Suppose the circle or globe to be taken as the initiatory element of composition: in that case we have the globe and the cylinder, both capable of being increased or diminished at pleasure; but both, when applied to architecture, incapable of producing that degree of unity combined with variety to which the square and the parallelogram may give rise; because the cylinder, though it may, like the parallelogram, be varied in length or diameter, cannot, like the parallelogram, be placed on its broad side. A building, therefore, in which round towers are the prevailing forms, can never have so much variety as one in which the towers are rectangular, other circumstances being the same. If, however, rectangular forms are combined with round towers in such a manner as to preserve unity of effect, the variety produced will be so much the greater.

We have now to consider how a whole is to be produced by means of *Lines*. Here it may be necessary to begin by observing that there are, properly, no such things as lines in nature; but that the word is used by artists solely with reference to art; that is, to the appearance of lines which is produced by forms, and to the necessity of beginning with lines in all graphic delineations of objects. If the forms of a composition are as they ought to be, so also will be the lines. The consideration of lines, therefore, may be viewed as the treatment of forms in the abstract; or as an assistance to us in the composition not only of forms, but even, as will be hereafter seen, of lights, shadows, and colours; since every thing which has length and breadth is necessarily bounded by lines.

As, in every building that constitutes a whole, there are certain prevailing forms, so there will also be found in the same building a prevailing character of lines. Where the parallelogram is chiefly laid on its broad side, there the horizontal lines will prevail: where it is chiefly placed on its end, or where the cylinder or round tower is the principal form employed, there

the prevailing lines will be perpendicular. Oblique and curvilineal lines are seldom found in buildings, except as indicative of roofs; and these roof lines, in all harmonious structures, will be found to have one prevailing tendency. If they are straight lines, then their degree of obliquity, or the angle which they form with the horizon, will generally be found to be the same, or nearly so, throughout. If they are curvilineal, they will, for the most part, be either segments of circles, or, if not of circles, of ovals or of ellipses, having the same transverse and conjugate diameters. A very extensive composition, however, may, in its roof lines, combine straight, oblique, and curvilineal lines; though this cannot be done without producing discordance or incongruity in small buildings.

The *Lights* in an elevation are produced by the breadth and the prominence of the forms; and the *Shades*, by the recesses, and by horizontal and perpendicular projections. Considering the lights produced in a composition in an abstract point of view, they ought to form a whole, independently of the shades, of the forms, or of the lines. Thus, there must be one prevailing form of light in every structure; and this will naturally result from one form prevailing more generally than any other, and from one general tendency of the lines. In an abstract point of view there must be one prevailing form of shade; and this, in its turn, will depend on the prevailing form of light. In buildings where the perpendicular forms and lines prevail, there perpendicular lights and shades should be prevalent; and in those where horizontal or oblique lines are most conspicuous, the lights and shades will follow the same direction. In analysing the elevation of a building, we shall find it possible that the forms and the lines may be in harmony, without that harmony extending to the lights and shades: thus, suppose the parallelogram form to be prevalent, and the building to consist of a number of long narrow parallelograms set on end, joined by broad parallelograms set on one side; the effect may be good, considered merely with reference to forms and lines; but if all the projections are at an equal distance from the main body of the building, then all the lights on these projections will be equally clear, and all the shadows produced by them equal in width and depth of shade. But to produce a whole, it is requisite not only that some of the projections should be broader than others, in order to give main features of light, but that some of them should exceed in projection, as well as in width, in order to give shadows exceeding in depth. Inexperienced persons, who cannot separate the effect of lines from the effect of lights and shades, are thus very apt to form an erroneous conception from outlines of buildings seen on paper; and, on the other hand, draftsmen, aware of the effect of lights and shades, in order to render a drawing on paper pleasing to the

eye, increase them beyond what the projections would actually produce, and thus deceive the spectator.

Colour, it may be thought, has very little to do with buildings, or, at least, with their exteriors; but this is a mistake. In every building, even of the most monotonous-coloured stone, there must of necessity be two colours; that of the walls, and that of the glass of the windows. If the roof is seen, there will probably be three colours; and, if the doors and other woodwork are not painted to imitate the walls, there will be four colours. If there are facings to the doors and windows; or if there are columns, or pilasters, or angle stones, of a different colour from that of the common material of the walls, there will be five colours; and if the roof have lead on the hips and in the valleys, or flashings round the dormer windows, there will be six colours. Finally, if veined stone or marble be used, either for the common material of the walls, or the columns, pilasters, or facings, there is no limit to the number of colours which may occur in a single elevation. The consideration of the subject of colours, therefore, is of importance in architecture; merely with reference to a building, considered independently of every other object: but when we view a structure, as situated in the country, and surrounded by verdant scenery, the colour becomes of increased importance.

What, then, constitutes a whole in the disposition of colours? The prevalence of one colour throughout an elevation; and this one colour assuming throughout the same general character of form and tint. Thus, if the walls of one front of a house are built of yellow brick, the principle of a whole will be violated by building the other front, or the sides, of a brown or a red brick; or if the principal front of a house is of Portland stone, and the other sides of Yorkshire or Bath stone, or of brick, the principle of a whole, with regard to colours, will be totally destroyed. The same may be said of the colours of the roof; for if one side were of red tiles, and the other of blue slate, the principle of a whole would be as completely destroyed, in that part of the building, as in the other case it was in the walls. It may now be asked, how the principle of a whole, with regard to colours, is to be maintained in a building, the walls of which are of one colour, and the roof of another; for example, white or red walls supporting blue or black roofs? Undoubtedly, where the roofs are very conspicuous, and the colours both of the walls and roof very bright, the principle of a whole is totally destroyed. A barn-like, blue, slate roof, fresh from the slater, and red walls newly erected, or walls newly whitewashed, present a most discordant picture, and one which can only be reconciled to an eye conversant with harmonious colouring by the effects of time and the weather in neutralising both colours. Where the colours of the roof and of the walls are in unison, as in

common brick buildings with tiled roofs, a whole, in respect to colours, is produced; and this whole would give much more satisfaction than blue slate roofs on white walls, were it not for certain prejudices against tiles on account of their commonness or meanness. The only way in which a building, having the colour of its roof totally different from that of its walls, can be rendered tolerable when quite new, is by concealing the roof, or flattening it to such an extent as to allow only a small portion of it to be seen. This is one reason why edifices with concealed roofs are generally more satisfactory to the eye, than those where the roofs are conspicuous. In old buildings, such as cathedrals, where the roofs and the walls are alike grey with age; in cottages, where earthen walls, or walls of stone of a grey or dingy colour, are covered with thatched roofs; or in cottages with brick walls, having tiled roofs, the whole produced, is, with respect to colours, an unobjectionable composition.

In the cases of buildings in the country which are surrounded by vegetation; or in others on eminences without trees, and backed by the sky, the colour of the building, including both the walls and roof, ought to be such as not only to form a whole of itself, but also to form a whole, when combined with the surrounding scenery, or the sky. Large conspicuous roofs, of a blue or of a green colour, are alike unsuitable for both situations; because blue does not harmonise with green, nor with the sky; and because green is monotonous in one case, and discordant in the other. The colour of a building, to be opposed to the sky, ought to be of some whitish, yellowish, reddish, or brownish tint; avoiding, as extremes, blue and green. The same observation will apply to buildings intended to be placed in the midst of verdant scenery, and more especially to such as are of small size, and which must, of necessity, form component parts of a composition, and not a whole by themselves. At the same time, it must be observed, that small artificial objects, placed in the midst of natural ones, such as a white cottage with a blue slate roof in a wood, though considered in the abstract as inharmonious, yet in the reality, by the reflection of the lights and shadows of the surrounding objects, may be rendered harmonious, and consistent with the idea of a whole.

We shall enter on the subject of colours more in detail, when we come to develope the principle of variety, as applied to architectural composition. In the meantime, we are most anxious to impress on the minds of our young readers the great advantages to be derived from founding their knowledge of architecture on principles, rather than on rules. Hitherto, in this country, at least as far as we know, there has not been the slightest attempt to teach architecture on any other basis than that of precedent; and the consequence is, that the minds of most architects are incapable of tracing effects to first prin-

ciples; that is, to those causes which operate altogether independently of what has been done by their predecessors. The metaphysics of architecture, however, as of all the arts of taste, and indeed of all arts whatever, form by far the most important part, with reference to their improvement; for how can the human mind be satisfied by those by whom its nature is not understood?

ART. II. *On the Harmony of Enrichment in Architecture.* By E. TROTMAN, Esq.

WE suspect that there is no error more common among the superficial observers of architectural composition, than the misapprehension of the character and application of enrichment. The eye of the vulgar is delighted with the greatest possible superabundance of carved work; and even the uninitiated man of taste, who has withal obtained some general ideas on the subject from buildings and from plates, may perhaps entertain the notion that the use of enrichment is scarcely governed by any considerations than those of pecuniary expenditure. And even where the observer was able to discriminate between the enrichments appropriate to different styles of architecture, there is little reason to expect that he would be able to discern upon what principles that appropriateness was founded; whether, indeed, it had any other basis than the conventional sanction of association, or were, on the other hand, supported on the fixed laws of fitness and harmony. To the architectural student, this subject, indeed, affords occasion for enquiries of peculiar interest, the result of which will be somewhat different to the impressions which he may have experienced upon the first investigation of architectural ornament, when a warm imagination suggested that little was to be done but to give free license to the rovings of the pencil. It too often happens, however, that this license is found to be least attainable when most needed; but were it otherwise, and could we at all times seize and embody the visions of richness and of beauty which may flit before the eye of the imagination, our success would be at best but very imperfect, vigorous as our compositions might chance to be, unless they were subjected to the test of fitness to the purposes of association, harmony, and expression. In what manner this principle of fitness is developed and sustained by examples of confessed authority, we will devote a few lines to investigate. It is indeed to be admitted at the outset, that the origin of most of the varieties of architectural enrichment is attributable to accident, the accidental varieties of climate and locality; but the same may be observed, in a great measure, as to the different styles themselves to which such matters of detail belong. It is for us, therefore,

to notice how those circumstances, which, in the latter case, governed the suggestions of casualty, and, in the formation of style, imparted to them a specific complexion, exercised in the former also an assimilating influence, so as to invest details of common origin with a character inalienably appropriate to that of the style in general to which they stand applied. Thus while the productions of the vegetable world afforded the same patterns to the Greek and to the Roman artist, the uses made of them by the two were essentially different. In the taste which led the Greek to select the honeysuckle as the constant favourite, we recognise that love for beauty in its simpler form which governed the composition of their temples at large. In the graceful neatness which characterised the play of curves in that enrichment, and the delicate relief and finish which gave brilliancy to the contrast of its lights and shades, the same feeling prevails that imparted to the profile of every moulding its elegant contour. The lotus, the egg, the rose, the wreath, exhibited all, in form and in arrangement, additional instances of the simplicity that is at once understood, united with the beauty that is instinctively admired; and, where the richer foliage of the acanthus obtained admission, its treatment was conducted upon the same principles, without any complex masses or convolutions. It will be seen, therefore, how that spirit which educed from earlier prototypes, and from the exigencies of the case, the Grecian system, pervaded the composition of all the ornamental details applied to that system, and gave unity to the whole. With how little effect would the same embellishments have appeared in connection with the lavish grandeur of Roman composition! Here, then, the mind that dictated the display of large and picturesque masses and redundancy of moulding, seeking to impress by profusion rather than to captivate with grace, bestowed upon its details of foliage characteristics of correspondent boldness and exuberance. The enrichments for individual mouldings were now multiplied beyond enumeration: the honeysuckle, to be received at all, must be mingled with and supported by the acanthus; while the latter, again, was treated with a freedom unknown to Grecian foliage; its richly undulating masses being employed in frieze and panel with an unsparing hand. Festoons and garlands, coffers and flowers, frets and guilloches, were now used in unprecedented profusion and richness. In all such varieties of Roman ornament, we observe that the delicacy and smoothness of Greek enrichment were as much neglected, as its thinness was carefully avoided. The Grecian detail bespoke the cultivated genius of the geometrician; the Roman that of the painter. To the former, indeed, belonged the charm of beauty in simple outline; to the latter pertained the fulness and the force which result from grouping of masses, and breadth of light

and shade. While, then, a little practice will enable the student to detect those peculiarities which constitute the difference between the Grecian and the Roman treatment of ornamental foliage, it will be well for him to follow out the examination of the causes of this difference, which will lead to the conviction that the characteristics of distinction are not arbitrary, but are the consequence of that peculiarity of mind which, pervading all the systems of architectural practice, gave to the whole unity and decision; a peculiarity of mind, in the case of Roman art, strikingly national, which, after the reception of the first fundamental principles from the taste of the Greeks, forbade submission to the dictates of any foreign school as to the cultivation of those principles, knowing no other law than the suggestions of splendid schemes and inexhaustible resources.

A still more powerful illustration of the manner in which the genius of an individual system thus governs the character of its enriched details, with a view to the preservation of unity, will be displayed upon an examination of the composition of foliage in the great style of northern climes, and of what we are accustomed to call the dark ages. The period, indeed, that gave birth to and fostered the style of pointed architecture, was confessedly one of moral and of literary darkness; but we think it is undeniable that the flights of the imagination in search of the wild and the awful are, for the most part, in the inverse proportion to the depth of scientific knowledge and the extent of matter-of-fact calculation. Thus it was with the style of our Henries and Edwards; the authors of which, in attaining for their works that inimitable sublimity which affects every heart, looked not abroad for the helping hand of classic accomplishment, but regulated their designs by the analogies of nature and by the dictates of experience. The genius of their great style was that of mysterious grandeur. It was in the exhibition of this characteristic that its resources were most fully and advantageously developed, however successfully they were applied to the attainment of all minor purposes of the picturesque and the beautiful. As compared with the mathematically proportioned architecture of preceding ages and of classic lands, this system presents itself to the imagination rather as the creation of the mighty spirits of the air, than of the earth-born race of man. The ponderous materials that remain suspended aloft, as if thrown forth in the playfulness of some invisible hand, whose power arrested them ere they fell, and fixed them in their course, bespeak an agency like that which is fabled to sustain the coffin of the Arabian prophet, rather than the calculating skill of the labouring artisan. How do the spreading vaults of pointed architecture, its flying buttresses, its massive pendants, its slender shafts, its widely ramified windows, its

overhanging tabernacles, proclaim the daring of that power which could give order to the masonry, the wondrousness of that hand which could bestow the durability of ages on fabrications to all appearance so perilously slight! It were itself the work of a lengthened essay, to notice the means by which all the details of this style are made tributary to the production of this effect of the magically sublime. Our business is at present more especially with the character of its ornaments of foliage, which are equal in beauty, and superior in variety and in nature, to those of other styles, while they display an adaptation to harmony of effect altogether admirable. This adaptation is not only the result of that freedom of composition for which these accessories are remarkable, but is more particularly the consequence of that peculiar management of light and shade by which Gothic foliage is distinguished from every other kind. In other styles, when the outline of a piece of foliage is fully drawn out, the shadows follow of course in the direction of the stems and their indentations; here, however, the shadows usually cross the lines of the stems and veins of the leaves, generally assuming a circular form, and sometimes describing a succession of concentric curves, like the rippling of the disturbed water where a stone has fallen. Hence an elaborate piece of foliage, in the best period of the art, is strongly marked with the shadows of knobs and protuberances, its edges at the same time being less finished and defined than those of classic composition. All this, indeed, every architect knows, and every student may know who has access to our cathedral or collegiate antiquities, or who, in the absence of this advantage, can refer to the works of Halfpenny, Pugin, Atkinson, Shaw, and others, upon this subject. Our object is especially to remark that this peculiarity of light and shade is strikingly in accordance with the genius of the pointed style. It is not, indeed, favourable to our immediate comprehension of the subject of design; no details in this style are so, otherwise the effect of the mysterious, as one great attribute of the system, would be at an end. Its excellence is, that, while it offers to the eye an aspect of great richness, from the playful sprinkling of shadows, it retains the interest of the beholder by developing the figure of the ornament gradually upon a more careful examination, presenting to him a double instead of a simple picture, one in the distribution of chiaro-scuro, and the other in the composition of outline. Hence, after the inspection of this as well as all other ornamental detail which contributes to the charms of pointed architecture, the casual observer will confess that an effect of peculiar power has been produced upon his mind; but, on his endeavouring to recall the means by which it has been gained, he will find his efforts altogether eluded. This is not to be done by confusion of decorative forms: it is, on the

other hand, a remarkable exemplification of the adaptation of methods to the attainment of the great ends of harmony; an instance of that architectural might of our forefathers, the effects of which are as irresistible, as its principles are deep and recondite. An accurate observation of these points of distinction between the enrichments of foliage peculiar to different styles is, of course, fundamentally necessary to correct composition; and that, as we have endeavoured to show, not on the ground merely of that habit of association which makes us identify certain forms of ornament as appropriate to certain systems, but more especially, also, on account of that innate fitness of parts to the production of unity in the whole, which distinguished ancient art; a characteristic resulting from the unity of feelings, wants, and circumstances, which affected the minds of those who created the several styles; a characteristic, also, which cannot safely be disregarded, until it shall have been proved that the successful cultivation of any particular mode of architecture depends upon some other principle than that of the use of correct component parts under a correct arrangement.

We had intended to notice some farther matters as affecting the *application* of ornament; our limits, however, forbid us at present to proceed; and we leave the reader, therefore, to examine and dilate upon the principle of generic fitness which we have here laid down, as he may find opportunity.

Furnival's Inn, July 15. 1834.

ART. III. *The Elements of Grecian and Roman Architecture, practically explained to the General Reader.* By Mr. ROBERTSON.

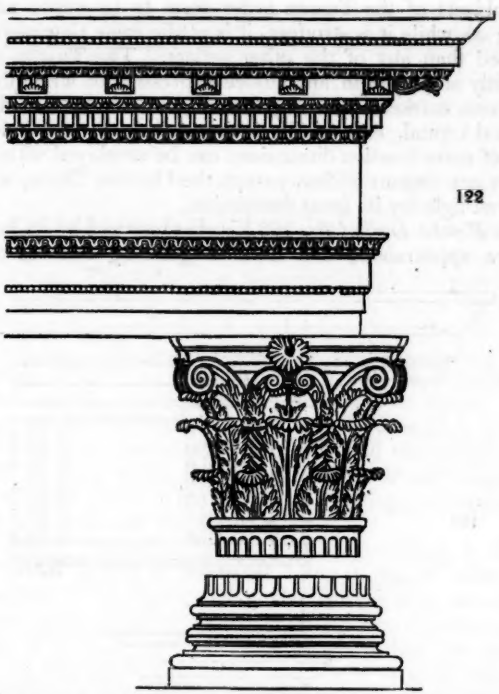
(*Continued from* p. 158.)

OF the Grecian Orders respectively.—The *Grecian Doric* was the first order which was invented; and in the simplicity of its forms there are many traces of the essential parts necessary in the construction of the primitive hut; having the triglyphs in the frieze as representatives of the joists; and, as representatives of the rafters, what are called mutules in the under side of the cornice, with inclined soffits to show their inclination in the roof, and generally chiseled to give a sort of roughness, in imitation of the ends of the rafters. (See the under side of the cornice, directly over *d*, in fig. 10. p. 25.) In the first age of this order, the columns were extremely short in proportion to their width, and they were placed on the floor, without either pedestal or base: indeed, the shortness of the shaft, and the tapering form, being the frustum of a cone, are still characteristics of this order. The column was originally without flutings, and the capital exceedingly simple, having no annulets to separate it from

the shaft: a very rough, ill-shaped, quarter-round moulding, bearing the abacus, was employed instead of the echinus; and its projection did not exceed the lower diameter of the column. In the best examples of this order, the column is from five to six diameters in height; the shaft is without a base, but is occasionally set on a plinth, and it has twenty elliptical flutings, that meet in a sharp edge without any fillets to divide them. The capital is one half of a diameter in height, and very simple; having only a plain square abacus supported by a very flat ovolo of great projection, and five or six annulets to separate it from the shaft. The distinguishing features of the entablature are, the triglyphs in the frieze and the mutules in the cornice. The architrave and frieze occupy each more than one third of the whole height of the entablature; the remainder being given to the cornice. The peculiar grandeur which belongs exclusively to this order renders it well adapted for situations where grave solidity and solemnity are desired. (See fig. 10. in p. 25.)

The *Grecian Ionic* (see fig. 11. in p. 26.), which is said to have been invented by the inhabitants of Asiatic Greece, is the second of the Grecian orders. The height of the column is generally less than that of the Roman Ionic; but the entablature is much bolder, and more simple, being composed of fewer parts. The characteristic features are the volutes of the capital, which are placed flat on the column, and the enriched ovolo which connects them. The Grecian Ionic is generally fluted; and it has an air of grandeur, which is, perhaps, not so fully possessed by the Roman Ionic. The best examples are those which are copied exactly from the temple of Ilissus. This order, from its graceful appearance, is very suitably employed in the interior of dwellings; and externally in porticoes, colonnades, &c. The details of the Ionic orders will be more fully explained under the head of Roman Ionic. (p. 263.)

The *Grecian Corinthian* (*fig.* 122.), which is a perfect masterpiece of art, and which is said to have been invented by an Athenian sculptor (though this has latterly been much disputed), is the third and last of the Grecian orders. The most striking feature is the capital, which is of great height, and is enriched with leaves. Both the Greeks and Romans executed this order, in their temples and public buildings, in the most highly decorated manner. The entablature was richly ornamented; having its architrave with three fascias of unequal height, and the frieze decorated with foliage; the bed mouldings of the cornice, and the mouldings of the architrave, were highly enriched; and the column was fluted. Although the general property of this order is, that it admits of the greatest degree of ornament, it is frequently executed with much propriety in the most plain and simple manner. Its slender delicacy advances it to the highest



degree of lightness consistent with solidity; for it is generally admitted that a column of wood, or stone, of more than ten diameters in height, has the appearance of being incapable of supporting an entablature. This order appears to have been better understood, and more happily executed, by the Romans, than any of the other Grecian orders; and, as the proportions of the Grecian Corinthian are exactly the same as those of the Roman Corinthian, I shall describe its other characteristics under that head. (p. 263.)

Of the Roman Orders respectively. — The *Tuscan* (see fig. 14. in p. 30.) is the most massive and solid of all the Roman orders; and, as it is composed of but few parts, and these without ornament, its characteristic features are massive proportions and great simplicity. It is said to have been invented in Tuscany; but modern writers have contended that the Etruscans have, in its composition, only slightly deviated from the Doric order; because, when the latter is divested of its triglyphs, mutules, &c., it is nearly the same in appearance as the Tuscan. The

chief objects of the Tuscan order seem to be utility and economy; as, while it is stronger, it is at the same time more easily executed than any of the other orders. The Tuscan order is most fitly employed in any edifice expressive of strength; such as prisons, markets, barracks, &c. The column, including the base and capital, is seven diameters in height; and indeed, no order of more massive dimensions can be employed with advantage in any elegant edifice, except the Grecian Doric, which is rendered light by its great diminution.

The *Roman Doric* (*fig.* 123.) is characterised by its bold and massive appearance; and its distinguishing features are the

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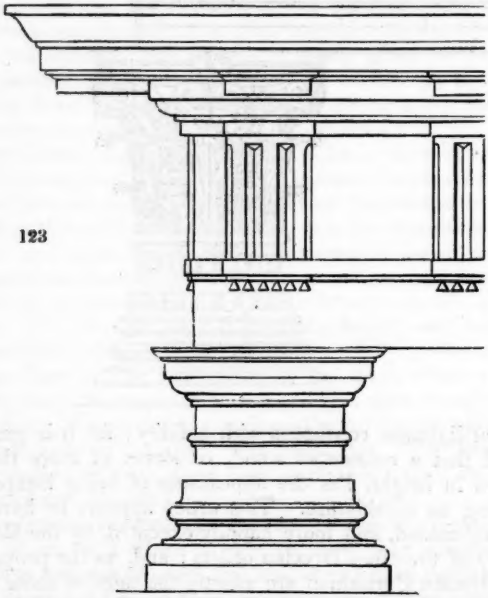


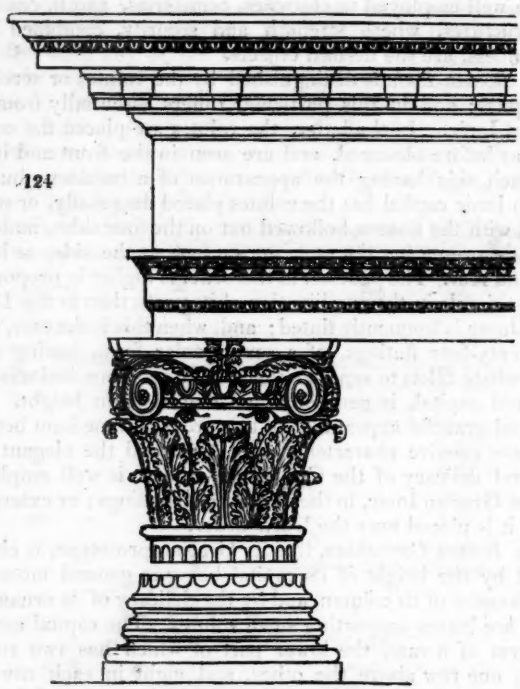
channeled projecting intervals in the frieze, called triglyphs. These are placed over the centre of the columns: they serve to regulate the intercolumniations, and are at such distances that the metopes, which are the spaces between the triglyphs, are left exactly square. This order is next in strength to the Tuscan; but it is less simple in expression, and possesses more symmetry in its members. The column is frequently fluted, like that of the Grecian Doric, and is sometimes placed on a base only, but generally on a base and plinth: the height of the column, including the base and capital, is eight diameters. This order

may be well employed in churches, cemeteries, and in commercial structures, where strength and security, combined with gracefulness, are the desired objects.

The *Roman Ionic* is distinguished by the volutes or scrolls of the capital; and in this particular differs essentially from the Grecian Ionic. In the latter, the volutes are placed flat on the shaft, as before observed, and are seen in the front and in the rear, each side having the appearance of a baluster; but the Roman Ionic capital has the volutes placed diagonally, or on the angles, with the abacus hollowed out on the four sides, and consequently presenting the same appearance at the sides as in the front and rear. The pedestal in this order is higher in proportion, and less simple in the combination of its parts, than in the Doric. The column is frequently fluted; and, when this is the case, there are twenty-four flutings, of a semicircular form, having small intermediate fillets to separate them. The column, including the base and capital, is generally nine diameters in height. The light and graceful appearance of this order is a medium between the grave massive character of the Doric and the elegant richness and delicacy of the Corinthian, and it is well employed, like the Grecian Ionic, in the interior of dwellings; or externally, where it is placed over the Doric order.

The *Roman Corinthian*, like its Grecian prototype, is characterised by the height of its capital being in general more than one diameter of its column, and by the delicacy of its ornaments, which are leaves supporting small volutes. The capital assumes the form of a vase, the lower part of which has two rows of leaves, one row above the other, and eight in each row; the upper part has a third row of leaves, which support eight small volutes, and these in their turn support a decorated concave abacus. The other characteristics of this order are, the divisions of the cornice, which has both modillions and dentils; the decorated frieze; and the unequal divisions of the architrave. The column, including the base and capital, is ten diameters in height. This order (as before observed) admits of the highest degree of enrichment; and, in all cases, it has an air of dignity combined with beauty. It may be well employed in magnificent edifices, both externally and internally.

The *Composite* (*fig.* 124.) is, as its title imports, a composition, and it is formed from the Corinthian and Ionic orders. The capital, like that of the Corinthian, is in the form of a vase, having two ranges of acanthus leaves: it is distinguished from the Corinthian capital by having the scrolls or volutes as well as the enriched ovolo of the Ionic; but in other respects the column is similar to the Corinthian, both in its general proportions and in the details of its mouldings. The entablature is frequently made more simple than that of the Corinthian, and is composed



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of fewer parts; the cornice has the blocks and dentils of the Ionic, and the architrave has a single fascia. While the members of the Corinthian predominate in the column, those of the Ionic are most conspicuous in the entablature. It has been justly disputed whether the Composite deserves the name of a distinct order; and it has been considered even less entitled to this epithet than the Tuscan, which, as before observed, is only a simplification of the Doric. The three Grecian orders possess all that is included in the five Roman orders; for, while the Doric at one extreme is expressive of strength and solidity, and the Corinthian at the other extreme is expressive of delicacy and richness, the Ionic, as an intermediate order, is expressive of grace and elegance. A variety of orders, of the Composite kind, have been invented by the Romans, having the proportions of the Corinthian, but each differing in the ornaments adorning the capital. The order generally termed the Composite has been selected, by architectural writers, from the others, and is of the general appearance described and figured

above. This order is never seen to advantage in connection with the Corinthian; and the inventors of it seem to have been aware of this, for they generally employed it in the erection of triumphal arches, theatres, and other structures, where it was quite unconnected with the other orders.

The Diminution of Columns. — The shafts of all the columns of the five orders are diminished in diameter as they rise. The columns of the ancients were tapered from the base to the capital in a straight line, in imitation of trees; but in the best examples there is a swelling in the middle of the shaft: indeed, this convexity is necessary to prevent an optical delusion which would make the sides of the frustum of a cone, when of a considerable height and tapering in straight lines, to appear concave. The general way of diminishing columns is to commence the diminution at one third of the height of the shaft, and to make it, at the top, not less than one eighth nor more than one sixth of the upper diameter.

Pilasters must not be regarded as imitations of columns, as they owe their origin to the necessity of giving more solidity to the walls of the cella (the part enclosed by walls, and sometimes called naos) of Grecian temples, in which they were originally used merely as supports, without either base or capital. Subsequently, in order to give pilasters more elegance, as well as to ornament the walls of the cella, a base and capital were added to them; differing, however, from those of the columns with which they were connected. The Romans were the first who gave the same base and capital to pilasters as those of the columns behind which they were placed; and modern architects have not only followed this practice, but have given them the same proportions, ornaments, names, &c., as are given to the columns with which they are associated. The Romans frequently entirely detached the pilasters from the wall against which they were placed, and as frequently employed them without any columns being placed before them; they have also used them in a variety of ways in connection with insulated columns.

In the best examples of the present day, pilasters have their bases, capitals, and entablatures the same height as those of columns; but, while the proportion is the same, as it regards the height of capitals, the breadths are different, and the developement of the form of a pilaster gives a greater space to each of its faces, because it is quadrangular.

Pilasters are distinguished, in the same manner as columns, by the names of Tuscan, Doric, Ionic, and Corinthian; and, when employed in connection with columns, they are frequently diminished in the same proportion as the columns themselves. When they are placed very near the columns in front of them, they ought to project from the wall about one eighth of their

diameter; but, in large porticoes or peristyles, where they are placed at the distance of 8 ft. or 10 ft. behind the columns, their projection must not be less than one sixth of their diameter; and their projection, when on a line with columns, should be regulated by that of the latter. In the last-mentioned case, when the entablature is continued without breaks over both pilasters and columns, the former are diminished on the front face only, leaving the sides perpendicular. When pilasters are employed alone in an architectural composition, their projection ought not to be less than one fourth of their diameter, as this gives great regularity to the returned parts of capitals, especially when these are of the Corinthian order. Half pilasters are frequently used, two of which meet in internal angles; but the irregularity of the cornice, when thus employed, shows the necessity of avoiding the practice whenever it is possible to do so. Pilasters, like columns, are occasionally fluted; but the exact number of the flutes is not determined by antique examples: they are, however, always employed in uneven numbers; and when the pilaster projects less than half a diameter, the flutings are never made in the returned part.

Bayswater, August, 1834.

Art. IV. *Architectural Maxims.*

Architectural Criticism, when it explains to what circumstances buildings owe their power of pleasing, and what tends to increase and what to diminish that power, is of great value to the practical architect, and a great source of instruction and enjoyment to the amateur. It teaches the architect what he has to avoid, and what he has to imitate; by what different modes of composition he can produce the same effects; or how to produce different effects by similar modes of composition. (*Woods.*)

Imitation in Architecture. — There are two modes of imitating the architecture of other countries; one true and legitimate, the other false and heterodox. The true mode is less an imitation than an adoption; being the reception, in the manner of an alphabet, of the system, rules, and taste of a foreign style, and adapting them to native habits and customs. Thus it was that the Romans adopted the architecture of Greece, converting the orders of Attica to the uses, habits, and climate of Italy. (*Elmes.*)

Criterion of Excellence in Architecture. — We may judge of details by rule; but the only true method of estimating the excellence of an architectural composition is by the sentiment it produces upon a well-regulated and cultivated mind and heart in a healthy body. To render this criterion the more certain, repeat the inspection under different circumstances. (*Woods.*)

REVIEWS.

ART. I. *Essay on the Architecture of the Hindús.* By Rám Ráz, Native Judge and Magistrate at Bangalore, Corresponding Member of the Royal Asiatic Society of Great Britain and Ireland. 4to, pp. 64, 48 plates. London, 1834. 1*l.* 11*s.* 6*d.*

THIS work, if we are not mistaken, will go far towards altering the generally received hypothesis respecting Hindú architecture. Most writers, among whom is included Quatremère de Quincy as the most eminent, consider Indian architecture as of Egyptian origin; but it is clear, from the work before us, that it has a much closer affinity to Grecian architecture than to that of Egypt, or of any other country. It is proper to state, however, that there are three tolerably distinct kinds of architecture existing in India. First, the architecture of the caves, which may very fairly be considered as having some analogy to that of Egypt, and which Quatremère de Quincy appears to confound with the architecture of the pagodas; secondly, the Gothic or Saracenic architecture of India, supposed to have been introduced by the Mahometans; and, thirdly, the Hindú architecture described by Rám Ráz.

Rám Ráz, who died in India before his work was published, was induced to undertake it as a topic "worthy of his abilities and talents," by Richard Clarke, Esq., a member of the Royal Asiatic Society. Rám Ráz, though descended from kings, was born of poor parents; and owed the little education which he received, when a boy, to mere chance: a portion of that education, however, consisted in learning to read and write the English language. He began life as a clerk to the adjutant of a native regiment; and rose in the civil service till he attracted the attention of a public functionary, who procured for him the responsible and highly honourable post of judge and magistrate. He knew the Sanscrit, and several of the native dialects; and also algebra, geometry, geography, and astronomy. We mention these particulars, to enable the reader to form his own opinion of the competency of Rám Ráz to produce a work on architecture. Speaking of his undertaking in the preface, he observes:—

"The subject of Hindú architecture is curious, and highly deserving the attention of the antiquarian and the philosopher. A correct account and accurate elucidation of the art of building practised by the Hindús must throw considerable light on the early progress of architecture in general. Some of the western authors have traced a certain resemblance in the leading features of the buildings in Egypt and India, and have thence concluded that there has very early been a communication of architectural knowledge between the two countries. But it is not altogether improbable that this resemblance may be merely owing to accident; inasmuch as, in architecture as well as in every other art indispensably necessary to the comfort of mankind, two or more nations may possess something in common, without having any intercourse with each other; for, the wants felt by man being the same, it is not surprising that the remedies resorted to for supplying them should be also similar or nearly so. If, on the other hand, however, both these countries had actually any communication in early ages, it is hard to determine which of them may have been indebted to the other. The western writers on antiquities have not placed this matter beyond a doubt; and, for my own part, I will not venture to affirm any thing with certainty, until I have collected sufficient information to form an opinion as to this alleged affinity in the architecture of Egypt and India. I humbly presume, therefore, that, until the *Silpa Sástra* (architecture) of the Hindús is correctly illustrated and laid before the public, the question as to whether the art owes its origin to the one or the other of the two countries, must remain problematical." (p. xiii.)

In the essay, we are informed, as we are in Columella and Vitruvius, respecting the agricultural and architectural writers of the Greeks and

Romans, that the Hindús had been in possession of numerous treatises on architecture and sculpture, but that very few traces of them remain. The names are given of nine out of forty or fifty treatises, of which some shattered fragments may still be found in Southern India. One of these, entitled *Mánasára*, is the most perfect that now exists. It treats at most length on building sacred edifices, but includes private dwellings, villages, and cities; embracing a variety of relative topics, distributed through fifty-eight chapters. The date of this work is unknown; but the antiquity given to it by tradition is altogether extravagant, some placing it three or four centuries before Christ, and others ten! Of the Mánasára, and other fragments of treatises, Rám Ráz observes, that "the architectural portions of them, if divested of all the extraneous matter with which they abound, contain little more than a dry detail of the technical names, and of the proportions of the several members of a sacred edifice. Considerable portions of these works are replete with minute descriptions of religious rites to be performed on various occasions, from the commencement till the completion of a building; as well as rules and aphorisms for predicting the future destiny of the builder." (p. 12.)

The first chapter of the Mánasára treats of the several measurements used in architecture, sculpture, &c.; and the second, of the qualities of an architect (*sthapati*), who, as Vitruvius recommends, is required to be "conversant in all sciences;" and, farther, to be "ever attentive to his avocations; of an unblemished character; generous, sincere, and devoid of enmity or jealousy." (p. 14.) Nearly similar qualifications are required for the surveyor or measurer (*sútragrahi*), and most of them for the joiner and the carpenter:—"It is impossible to build houses without the aid of these four descriptions of artisans: therefore, let the enlightened twice-born (the Brahmins, or men of the first class, &c.) gratify them in every respect. Woe to those who dwell in a house not built according to the proportions of symmetry." (p. 15.) The third chapter treats of the nature and quality of ground on which buildings are to be erected; it is very copious and very curious. Minute directions are given for constructing a plough, and for ploughing the ground on which the house is to be built. This being done, "let sesamum seeds, pulse, and kidneybeans be sown, with incantations pronounced over them; and let due reverence be paid to the spiritual teacher; and let the oxen, and the plough to which they are attached, be presented to him. When the crops are matured, let them be grazed on by cattle, and let cows remain on them for one or two nights. The ground will become purified by the froth flowing from the mouths of the cows, and by their ordure; after which, you may commence building in the centre thereof." (p. 19.)

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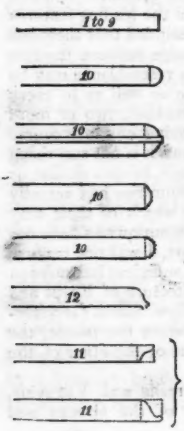

A long chapter gives directions for ascertaining the cardinal points by means of a gnomon, in order to place the building in a particular position relatively to the east. Passing over a number of chapters, Rám Ráz next notices the Hindú orders, which, he says, consist of four principal parts; namely, the pedestal, the base, the pillar or column, and the entablature. The Hindú architects, like those of Europe, include the base and capital when they take the height of the pillar or column. They also compare the various parts of an order to the several parts of the human body, much in the same manner as is done by Vitruvius.

There are twelve different descriptions of *mouldings* used in the composition of pedestals and bases, as shown in *fig.* 125. Of these, the name of the circular kinds (marked 10 in the figure), *cumuda*, signifies literally *Nymphæa esculénta*, and corresponds with the astragal, bead, and torus mouldings

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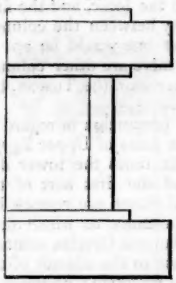

of the Grecian orders. The *padma* moulding (11), literally *Lòtus*, is supposed to resemble a petal of that flower. The mouldings (1 to 9) are all quadrangular, and answer to the Grecian fillets and plinths. A *capotum* (12) is the section of a moulding made in the form of a pigeon's head, from which it takes its name. It is a crowning member of cornices, pedestals, and entablatures; the beak of the bird serving the purpose of a spout to throw off the water falling on the cornice, and in this respect performing the office of the Grecian corona.

For the composition of *pedestals*, the Hindu architects, we are informed, have "a multiplicity of contradictory rules," as the reader may easily conceive by glancing at *fig.* 126., which is one of the simplest, and *fig.* 127., which is one of the more elaborate of twelve examples given by our author in his first plate. The rules for proportioning the different parts of these pedestals are given at great length, and we recommend them to the perusal of those who are learned in such matters.

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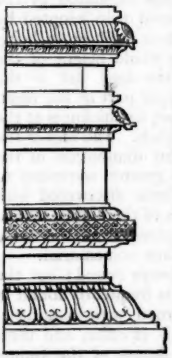

Of *bases*, twenty-eight different specimens are given, of which *fig.* 128. is the most simple, and *fig.* 129. the most elaborate.

The chapter on *pillars* treats of their various forms, dimensions, and ornaments. "Let the height of a pillar," says Mánasára, "be divided into twelve, eleven, ten, nine, or eight parts, and one be taken for the breadth of the foot of the shaft; and, the same being divided again by a number of parts, of which the height of the pillar may consist, let the upper extremity of it be diminished by one of those parts respectively." Cásyapa, another Hindu architect, says, "the height of the pillars may be three times that of the base, or six or eight times that of the pedestal. The breadth of the pillar may be a sixth, seventh, eighth, ninth, or tenth part of its height; if it be made of wood or stone, one third or one fourth; or one sixth of the height, if it be a pilaster joined to a wall." (p. 29.) Pillars may be square, or octangular, or with sixteen, with five, or with six sides; or cylindrical. The whole shaft may be of the same form; or, in pillars of other forms than square, the bottom, middle, and top may be quadrangular, and the intermediate spaces of other forms. Directions are given for ornamenting columns. Columns are divided into seven sorts or orders, according to the number of diameters which they are in height; the first sort is six diameters in height, with a high base and pedestal, and an entablature of more than half the altitude of the column. The capital to this order is equal in height to the upper diameter of the shaft, and its projection is equal to its height; and so on.

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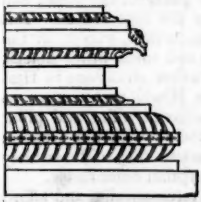

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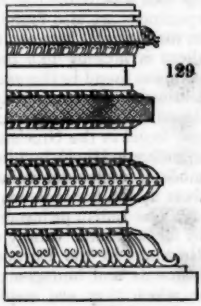

In comparing the Hindú orders with those of Egypt, Greece, and Rome, Rám Ráz observes:—

"The second sort of column in the Hindú architecture may be compared with

the Tuscan, the third with the Doric, the fourth with the Ionic, and the fifth with the Corinthian or Composite pillar. This affinity between the columns of India and of Rome and Greece is so striking, that one would be apt to ascribe it to something more than mere chance: but there are other columns in the Indian architecture not only one diameter lower than the Tuscan, but from one to two diameters higher than the Composite.

"The Egyptian columns appear to have no fixed proportion in regard to thickness and height. In some of the specimens of the ruins of Upper Egypt, the height of the columns consists of from four to six times the lower diameter; which last proportion coincides with that of the first sort of the Indian pillar. The orders of India and of Greece and Rome are remarkable for the beautiful effect of their proportions; a circumstance to which little regard has been paid by the Egyptians. Both the Indian and Grecian columns are diminished gradually in their diameter, from the base to the summit of the shaft; a practice which has never been observed in the Egyptian: on the contrary, a diametrically opposite rule has been observed in their shafts, which are made narrower at the bottom than at the top, and placed upon a square or round plinth. The proportion in which the diminution at the top of the columns of the two former is made, seems to have been regulated by the same principle, though not by the same rule. The general rule adopted by the Hindú architects in this respect is, that the thickness at the bottom, being divided into as many parts as there are diameters in the whole height of the column, one of these parts is invariably diminished at the top; but in the Grecian and Roman architecture, the diameter of the upper part of the shaft, in a column of 15 ft. in height, is made one sixth less than its thickness at the base; and in a column of 50 ft. the diminution is one eighth. The higher the columns are, the less they diminish, because the apparent diminution of the diameter in columns of the same proportion is always greater according to their height; and this principle is supposed to have been discovered with great scientific skill, and is adduced as one of the proofs of the highly refined taste of the Greeks: but we observe that precepts derived from the same principle have been taught and practised in India from time immemorial.

"The plan of the Grecian and Roman columns is always round; but the plan of the Hindú columns admits of every shape, and is frequently found in the quadrangular and octangular form, and richly adorned with sculptured ornaments. The form of the Egyptian pillars, too, is circular, and their shafts are often fluted like the Corinthian; but the fluting of the Indian column resembles neither the one nor the other. The decorations of the Egyptian columns often consist in representations of 'a bundle of reeds,' tied up with a cord on the top, having a square stone placed over it; in some specimens are also found bindings or fillets in various parts of the shaft, and in the intervals between them reeds and hieroglyphics are represented. But there is nothing like these ornaments in the Indian orders, except in the columns found in the excavated temple of Elephanta and some other places, and which differ materially from those employed in other situations in Hindústan. There are no fixed intercolumniations in the Hindú architecture, as are found in the Grecian; but the spaces allowed between pillar and pillar in different Hindú buildings are found nearly to coincide with the Grecian mode of intercolumniations, though in too many instances they differ widely from it, and the same may, perhaps, be said of the Egyptian colonnades.

"The Indian pedestals and bases are made more systematically, and afford by far a greater variety of proportions and ornaments, than the Grecian and Roman. In the European architecture, the forms and dimensions of the pedestals and houses are fixed by invariable rules, with respect to the orders in which they are employed; but in the Indian, the choice is left to the option of the artists. The capitals of the Grecian columns invariably mark the distinction of the several orders: those of the Indian are varied at pleasure, though not without regard to the diameter and length of the shaft; and the forms of the plainest of them, though they have in reality no-

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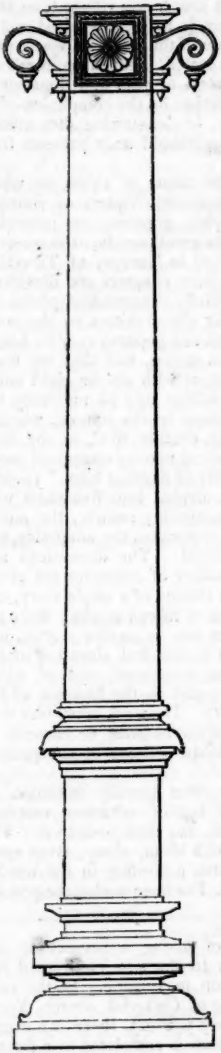

thing in common with the Grecian orders, are found at a distant view to bear some resemblance to the Doric and Ionic capitals; but those of a more elaborate kind are sometimes so overloaded with a sort of filigree ornaments, as to destroy the effect of the beautiful proportions of the whole. The Egyptian capitals, on the other hand, are formed into elegant vase shapes, decorated with the stalks, leaves, and blossoms of the lotus, and occasionally with palm leaves, which latter ornaments are supposed to have given the first idea of the Corinthian capitals. And in some specimens, the Egyptian capital is composed of the representation of the head of the goddess Isis. The entablature of the Indian order admits of little variety, as well in its composition as in its relative proportions; whereas the same member, in the Grecian and Roman architecture, is varied for each order both in form and magnitude. The massiveness of the Indian entablature offers a striking contrast to the lightness of the Grecian; but the richness of the former may be said to be unrivalled.

"In the existing treatises on Hindú architecture, no mention is made of anything like a substitution of human figures for columns to support the entablature, but the shaft is directed to be adorned with the figures of demons and animals; yet various examples are to be met with in which human figures, as well as representations of animals, are employed in bold relief in the sides of pillars in temples and porticoes, but by no means like those found in Egyptian architecture. The antiquity of this invention in India is not determined, but the Grecian architects refer the origin of their caryatides to the commemoration of their captivity of the Caryan women, while others assert that it was derived from an Egyptian source." (p. 40.)

For the forms and details of the different orders of Hindú columns, we must refer to the work itself. We cannot, however, resist the temptation of giving two specimens of columns, one with a pedestal, and the other without. (*figs.* 130. and 131.)

The ninth chapter of Mánasára treats of villages and towns, of which there are said to be eight sorts; and plans of several of these are given. All of them are surrounded by walls and ditches for protection: some of the villages are exclusively for brahmins; others for hermits; one for holy mendicants; and so on. Speaking of private houses or mansions for these villages, it is said that they may consist of from one to nine stories, according to the rank of the persons for whom they are built. "The lower class of persons must on no

account construct their houses of more than a single story, or ground floor." Outcasts are to live in huts, not nearer any village than 4000 yards. Every house is to have a raised seat or pedestal on each side of the door. A whole page of this chapter, it is stated, is taken up in enumerating the various sorts of gifts and donations * to be made to the artists on the completion of an edifice; and, finally, in denouncing dire misfortunes to those who withhold such presents from them. (p. 47.)

The next chapter treats of cities, to which succeed twelve successive chapters on vimanas, or pyramidal temples, gopuras, or pyramidal gateways, and on the great pagoda, or monastery, as it would be called in Europe, of Tiruvalúr. The extracts from these chapters are illustrated by numerous beautifully lithographed plates, for which we must refer the architect to the work itself. The vimanas and gopuras vary in height from one to sixteen stories, and they are made round, quadrangular, or with six or eight sides. "The form of the edifice may be uniformly the same from the basement to the summit, whether it be square, oblong, circular, oval, or the like; or it may be of a mixed nature, composed partly of the one, and partly of another form." (p. 28.) These temples are divided into five sorts with respect to their magnitude; namely, the moderate, the bulky, the victorious, the admirable, and the universally beloved. The dimensions and proportions of a number of examples are given, commencing with a vimana of a single story, and terminating with one of fifteen stories; there are also gopuras of from one to twelve stories, and a ground plan and isometrical elevation of the large pagoda before mentioned, and of which there is a beautiful model in the Museum of the Royal Asiatic Society. The work concludes with directions for preparing *chunam*, or cement, as practised by the Hindú artisans of the present day.

Chunam is made from gravelly limestone, or from shells washed out of saltwater marshes, burnt with charcoal, and then powdered. The powder is mixed with clean, sharp, river sand, in various proportions, according to the use for which it is intended. For finer works, the powder

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* The practice of giving a present to the builder, in addition to the sum contracted for, was formerly common in Europe. In the contract for the building of Catterick church, Yorkshire, dated 1412 (see p. 273.), there is a clause stating that, if the work is completed by a certain time, the money is to be paid to the builder, and a cast-off gown of his employer's given to him into the bargain. (For farther instances, see the work alluded to, p. 11.)

is very finely ground, and the water used in preparing it for mortar is generally mixed with molasses or coarse sugar. It seems this article is considered by modern practitioners, "who have had the most extensive practice in building, as an indispensable ingredient in a durable and hard cement."

It is remarkable, that, throughout the whole work, not a single word occurs on the subject of arches, though many of the vimanas and gopuras terminate in domes; there are, however, no arched openings, as doors or windows, and this circumstance seems another indication of the affinity between the Hindú style and that of Greece.

In conclusion, we have to observe that this work is curious in a historical point of view, as a record of a style of architecture which has no more chance of being revived, than the religion of the people to whom it belonged has of being perpetuated. The latter is overcharged with superstitious observances, only calculated for an age of general ignorance; and the former consists chiefly of gorgeous structures, overlaid with ornament, which could only be erected under a despotic hierarchy or monarchy. Such structures, indeed, could only excite the admiration and wonder of an abject people: for, in ages of darkness, though refined beauty makes no impression on the people composing the mass of society, they are easily awed by obvious indications of great wealth and power; they require something to fear and serve, rather than something to love and enjoy. In a historical point of view, the work of Rám Ráz is likely to be eminently useful to the painter, the scene decorator, &c., and it may afford some hints for the composition of ornaments to the architect, the cabinet-maker, and the designers of ornaments for different descriptions of manufactures. There is hardly any design in the work that we should consider deserving of being copied exactly, but the manner of some of the designs might be imitated and purified. The Royal Asiatic Society has rendered the British public a valuable service, in publishing so original and expensive a work at so low a price; and there can be no doubt the volume will find its way into every good architectural library.

ART. II. *Catterick Church, in the County of York: a correct Copy of the Contract for its Building, dated in* 1412; *illustrated with Remarks and Notes*, by the Rev. James Raine, M.A. Librarian of Durham Cathedral, &c.; *and with* 13 *Plates of Views, Elevations, and Details*, by Anthony Salvin, Esq. F.S.A., Architect. 4to, pp. 22. London, 1834.

WE cannot give a better idea of this work than by quoting a part of the introduction; and we request the reader to contrast the enthusiasm therein displayed for the Gothic style, with that shown for the Grecian, by the German architect Klenze, in a passage from one of his works, given p. 275., from the *Foreign Quarterly Review* for July, 1834:—

"The object of the present publication is to make known the original contract for the building of Catterick church, in Yorkshire, dated in 1412; of which we undertake to give an accurate transcript, with notes and explanations, and engravings illustrative of it and of the fabric to which it gave rise. Our ancient church architecture is again in the ascendant, proudly triumphing over all the various abominations of that dark age of English design and execution which commenced at the dissolution of religious houses, and extended, with a few exceptions, to the beginning of the present century. During this long period, men not only did not build after our good old English models, but they manifested, in far too many instances, an anxiety to destroy. Too ignorant to appreciate, they affected to despise; and too proud to feel ashamed, they gloried in their deeds of destruction. There may be still in the land those who care for no design but what they, in the folly of self-importance, determine, in spite of wiser heads, to be the best; and there may be men, pretenders to the name and qualifications of architects, ready to carry

such degenerate plans into vile execution; but their number, we rejoice to say, is rapidly decreasing. Such has been the reaction, that public opinion has, with one or two late melancholy exceptions (we are now speaking of the north of England), compelled men to act, if not to think, aright; and public opinion is not yet at rest. So rapidly is the study of our national architecture reviving, that he who has it in his power to bring to light such documents as that which forms the substance of the following pages, illustrating the cost of workmanship in times of old, and giving the various technical names of parts and things as they were used at their respective periods, many of which have been long forgotten because they were no longer required, will be thanked for his pains by all those genuine architects whose slightest meed is praise. The contract for the church of Catterick has much to recommend it to the architect; and, still more, perhaps, to those who take a pleasure in tracing the English language during its early history. In both points of view, it is of peculiar interest." (p. 6.)

This contract is, indeed, of very peculiar interest; and Mr. Rickman says that "a copy of it ought to be in the hand of every rational antiquary, that it may explain genuine architectural terms, and guide his search for similar documents." In the contract, the word "lavatory" is used to designate one of those water niches, always to be found immediately within the entrance of a Catholic church, and, by modern architects, called the "piscina;" and the annotator proposes to substitute the former word for the latter in future. The improvement is so obvious, that we have no doubt it will be generally adopted. No reference is made in the contract to working drawings; and it is suspected that models in wood, or drawings on wooden tablets, were in use in these times; and were generally made by the ecclesiastics, who were, for the most part, the church architects of this and preceding periods. The average wages of a mason, when Catterick church was built, was 7*d.*; a carpenter, 5*d.*; and a quarryman, 3½*d.* per day. The amount of the contract was 114*l.*, worth at least 684*l.* of present money; and, it is thought, the builder was amply paid for his workmanship, notwithstanding the smallness of the sum. The plates are beautifully etched; and, as an architectural curiosity, the work is well worth procuring by every man of taste.

ART. III. *Catalogue of Works on Architecture, Building, and Furnishing, and on the Arts more immediately connected therewith, recently published.*

BRITAIN.

KNIGHT's Unique Fancy Ornaments. In five parts, containing six plates in each. Published monthly. 4to, part 1. London, 1834. 4*s.*

The plates are most beautifully engraved. The frontispiece is a framework of scrolls, foliage, flowers, quadrupeds, birds, and insects, in the style of Louis XIV., and exhibits a good deal of fancy, and expertness in composition. Plate 2. contains fanciful borders and panel ornaments, in the style of Louis XIV.; plate 3., ornaments for panels and compartments, in a less grotesque manner; plate 4., ornaments in the style of Louis XIV.; plate 5., ornaments for vessels in the same style; and plate 6., ornaments in the same style, of various kinds. There is no letterpress. The work will be particularly useful to ornamental house painters, modellers, weavers, and, in general, to all ornamental manufacturers.

Billington's Architectural Director, &c. Parts 4. and 5. 2*s.* 6*d.* each.

We noticed, p. 180., the second and third parts of this work, and commended the accuracy of the plates. The same remarks may be applied to those given with the present number. One of these contains a transverse section of St. Peter's Church at Rome; another, the elevation of the Buon Campagna Palace, in the same city; the third is a ground plan of the Gius-

tiniani Palace; and the three remaining ones are details of the Tuscan and Doric orders.

Part 5. contains a plan and elevation of a private house in Rome; ornaments of mouldings; capital of a Corinthian pilaster; proportion of entablature; plans of arcades; and crowning entablature. Both Parts contain portions of the letterpress description of the plates, and of the dictionary. The latter as far as the article Carpentry.

A plain Statement of Facts, connected with the Coalition between the Society for the Promotion of Architecture and Architectural Topography, and the Society of British Architects. Pamphlet, 8vo, pp. 28. London.

The object of the author is to give "a complete *exposé* of the irregular proceedings of the Society of British Architects;" but, as we do not wish to enter into the merits of the case, we merely recommend his pamphlet to those who do.

GERMANY.

Stern: Theorie der Kettenbrücke, und ihre Anwendung. Theory of Chain Bridges, and its application. 4to. Berlin, 1834. 10*s.*

Klenze, Leo von, Court Architect at Munich: Sammlung Architectonischer Entwurfe, &c. Collection of Architectural Designs, &c. Fol. Munich, 1832.

Menzel, Carl A.: Versuch einer Darstellung des jetzigen Zustandes der Baukunst. Essay on the present State of Architecture. 8vo. Berlin, 1832.

MISCELLANEOUS INTELLIGENCE.

ART. I. *General Notices.*

ANTICIPATED Universality of Grecian Architecture.—Never has there been, and never will there be, says Leo von Klenze, more than one *art* of building (*eine Baukunst*), namely, that which was brought to perfection at the epoch of the prosperity and civilisation of Greece. Before this perfection was attained, it was necessarily preceded by many attempts; so, too, after the art itself was overthrown and trampled upon, both by time and by barbarians, some reverberations of it were yet sensible. Thus there were many modes of architecture (*Bauarten*) after as well as prior to its existence as an *art*. Grecian architecture alone is marked by universal propriety, character, and beauty; although any mode of architecture is capable of affecting us, and has a certain value of its own, when it is a really national style, and has grown up out of the religious and civil habits of a people. This Grecian architecture, taking it in the most extensive sense of the term, comprehends two leading epochs of its formation; namely, that in which all the apertures and intervals are covered by horizontal lines, and that when the arch was discovered and applied to similar purposes.

If we examine into and attend to this twofold developement of Grecian architecture in its elementary principles; and, in forming a style for ourselves, keep in view those precious remains of art which are yet preserved to us both in Greece and in Italy; Grecian architecture can and must be the architecture of the world, and that of all periods; nor can any climate, any material, any difference of manners, prove an obstacle to its universal adoption.

The history of art, he afterwards continues, like that of the world, proceeds step by step: just emerging, therefore, from out of the magnificent wretchedness (*das grandiose Elende*) of the middle ages, partly surrounded only by the remains of the most debased period of Roman art, partly attracted only by what was most homogeneous in it, viz. its bad taste, the artists of that period (the fifteenth and sixteenth centuries) could not possibly restore architecture to its native dignity, however meritorious their endeavours to do so may have been.

The gross architectural solecisms of a Buonarotti, the still more flagrant absurdities of a Giulio Romano, Maderno, and Borromini, which naturally resulted from them; the tasteless puerilities which reached their climax under Louis XV.; and, lastly, all the unmeaning and spiritless imitations of detached Grecian forms of a still later period, were any thing but calculated to arrest the defects observable in the works of the fifteenth century; so that an important task was still reserved for architecture in these our own times, when Grecian antiquity has been opened to us by so many literary and statistical works.

For some time past intelligent men of all countries have been labouring for the accomplishment of this object; and we also have added our endeavours to theirs; nor have we feared to set our face manfully against the mechanical workman system, derived from Vitruvius and Vignola, or against the empty groundless theories of praters about art, and the low miserable notions of those who see in architecture no other purpose or value than that of protecting ourselves as economically as possible against rain, heat, and cold. (*Introduction to Klenze's Collection of Architectural Designs*, as quoted in the *For. Quart. Rev.* for July, 1834, p. 108.)

A new Method of diffusing Light through a Theatre has been discovered by a mechanic at Venice. By the aid of parabolic mirrors, the light of many lamps is concentrated over an opening made in the ceiling of the theatre, and reflected down on a system of plano-concave lenses, of a foot in diameter, which occupy the aperture, and convey into the theatre the rays of light which arrive at them parallel, and depart from them divergent. From the pit the lenses are alone perceived, which resemble a glowing furnace; and, although the luminous focus is sufficient to light the whole theatre, it does not dazzle, and it may be viewed without fatiguing the eyes. The apparatus being entirely concealed, it accommodates itself readily to all the changes which the representation may require. It likewise occasions neither smoke nor bad odours, and has none of the inconveniences of the ancient system. (*Times*, July 12. 1834.)

Art. II. *Foreign Notices.*

GERMANY.

The two greatest Architects in Germany are Karl Friedrich Schinkel of Berlin, born in 1781, and Leo von Klenze of Munich, born in 1784. A very interesting account of some of the principal works of these artists, and of the present school of architecture in Germany, is given in the *Foreign Quarterly* for July, by a valuable correspondent of this Magazine. We have made several quotations and abridgments from it, which will appear in this, and in the succeeding Number; but every architect ought to peruse the entire article.

The Walhalla, or hall of the gods, which is erected on the hill Donaustauff, near Regensburg, is a magnificent temple-formed structure, in the most classical Doric style, with a noble portico, consisting of eight columns in front, and an inner range of six others; and on each of its sides are seventeen columns, the whole formed of marble, and raised on a substructure, in which is formed an ascent between massive walls of Cyclopean architecture. As its name imports, this edifice is intended to become a kind of universal German Pantheon, in which will be deposited monumental busts of the most illustrious citizens and heroes of Teutonia. In the interior is a magnificent frieze, executed by Wagner the sculptor; and the pediment of the portico will also be enriched by a suitable subject in relief. (*For. Quart. Rev.*, July, 1834, p. 112.)

NEW SOUTH WALES.

A Model for a Government House has recently been finished by Mr. Chadley, the surveyor. A project for erecting a magnificent town-hall in Sydney has been brought forward by Mr. Poole the architect, and it is warmly approved of by several influential persons. It is also in contemplation to erect a floating bath in Sydney Cove. (*Sydney Gazette*, Oct. 5. 1833.)

Art. III. *Domestic Notices.*

ENGLAND.

Lancashire.—Mr. Huskisson's Monument in St. James's Cemetery, Liverpool. A statue of this celebrated statesman has been completed by Gibson, a Liverpool artist, now in Rome, which is said to have given very general satisfaction: but the very reverse seems to be the case with respect to the building now erecting to receive the statue; and the following is an abstract of a criticism, which a correspondent has sent us, and which has appeared in the *Liverpool Chronicle* and the *Liverpool Mercury*. We entirely agree with the writer, and sincerely wish, with him, that it may not yet be too late to have the upper part of the temple thrown open.

"Mr. Huskisson's monument is a circular temple from the ground to the top. One third of the height is in plain rustic work, with a small entrance door to the south. On this rise ten half columns, fluted, of the Corinthian order, and solid masonwork between them almost to the capitals; on this a dome roof, with ten circular lights, terminating with a cross on the top. I am at a loss to know what sort of ideas the architect must have possessed, to erect a building which so much resembles the round-house at Everton, to place a marble statue in, the execution of which cost 1200*l.*: only think for a moment of the effect of a figure 7½ feet high, standing on a pedestal 3¼ feet high, shut up in a small circle, and even part of that cut up by a stair. It will be impossible for a spectator to have any other than a distorted view. It is a general rule, in viewing works of art, to go no nearer than what the extreme height or breadth may be. The famous Benvenuto Cellini said, that a whole-length figure should at least have seven points of view to know and appreciate it properly. It may be said you can have seven points of view here; but if you had seventy, it would be of little use, so long as the space to view it in is so confined that it will be like a horse in a mill, round and round, you cannot get a yard or an inch out of the track. The architects of the present day seem only to study how neat they can make a small model to be looked at on a mahogany table, regardless of the site, or how it may appear when erected. The mistakes that have lately taken place in the metropolis confirm this remark. At Buckingham Palace, for instance, after the building was up, it was found that the centre was too large for the wings; they were taken down and rebuilt, and now the centre is found to be too small for the wings. The dome, also, has been removed; and, when the architect was questioned about it before a committee of the House of Commons, he said *he was not aware* that it would have been seen from the Park. I would propose, as this statue was intended for a public monument, and one to be seen by all and at any time, that a meeting of the subscribers be called without delay, so that the building may be altered.

"This building is said to be a copy of Demosthenes's Lantern; but this it is not exactly. The tomb of Lysicrates, in the Capuchin Convent garden at Athens (commonly called Demosthenes's Lantern, built 333 years before the Christian era), was complete with open pillars to the base. It was not closed up between for some hundred years. This tomb is an open circular temple on a square base, and the grand effect produced by placing a circular temple on a square base, is well known, not only from this at Athens, but from Adrian's Tomb at Rome, the Temple at Tivoli, &c. It is bad taste to have the circle to the ground, because it gives the building too much the effect of a limekiln or pottery work. There is no small door reserved in the Athenian tomb, and that in the side of Mr. Huskisson's monument has a disagreeable effect; it ought to have been concealed. If the pillars had been complete and open, there would have been no occasion for a door, as the size of the building would have permitted visiters to the Cemetery to view the statue near enough without entering the building, and the effect would have been grand. On the one side the rich foliage of the trees as a background to relieve the white marble, on another the rocky banks of the Cemetery; the beautiful effect of the rising or setting sun, or the pale moonlight glimmering

through the pillars; would have added to the grandeur and solemnity of the place. On enquiring the reason for shutting up the figure, I was told it was to preserve it from the weather. It has been proved that the marble the figure is made of will stand the weather for ages entirely exposed; but this would have had sufficient shelter with the dome top, standing as it does in a hollow, and surrounded by the rocks of the Cemetery.

"There is yet time, before the figure arrives, to rectify this, and it behoves the subscribers to bestir themselves, and prevent so beautiful a statue being consigned to this *dark lantern*. When it was proposed, it was intended for a public monument, but it is likely now to be a private one, and not to be seen without the attendance of the *custode* with an iron key and the visiter with a silver one."

It is probable that the architect of the Huskisson monument was not aware that the filling up of the spaces between the columns was a modern addition; for we find the same tomb of Lysicrates with the fillings-in between the columns, copied as a tower, or *campanile*, to one of the chapels in Regent Street, which was erected a few years ago, either from the designs of Mr. Nash, or from those of some one in his office. Nothing can show a greater poverty of taste, or more innate slavery of mind, than the practice of indiscriminately copying whatever was done, or supposed to be done, by the ancients. It will be disgraceful to Liverpool if this hybrid temple is allowed to remain as it is. — *Cond.*

SCOTLAND.

Renfrewshire. — A beautiful Granite Sarcophagus, from Egypt, has lately been placed in Hamilton Palace. It was found in one of the pyramids, and is said to have contained the mummy of one of the ancient kings, which has been recently sent to the Edinburgh museum. The sarcophagus measures 7 ft. in length by 3 ft. in breadth, and, in the middle, about 3 ft. in depth on the outside; and weighs about 4½ tons. Over the whole surface are engraved pictures and hieroglyphics, very much defaced. (*Elgin Courier*, May 16.)

Selkirkshire. — A Bridge of a novel Description has been erected over the river Ettrick, at Fauldshope, in the Forest of Selkirkshire. It consists of a single arch upwards of 76 ft. of span, an exact semi-ellipse; the rise from the chord line being only 20 ft. The whole is constructed entirely of rubble whinstone; and it is believed to be the largest arch of this description in Great Britain. The curve line of the arch, notwithstanding the extent of the span, and the humble description of the materials of which it is composed, remains mathematically correct. This spirited attempt on the part of the agents of the Duke of Buccleugh, in producing, at a moderate expense, so useful a structure, of such simple materials, it is hoped, will not be overlooked by road trustees and architects. Messrs. Smith of Darnick are the builders by whom the bridge was planned and executed. — *J. W. Dumfries, July* 3. 1834.

All masonry is essentially either cementitious, that is, depending for its strength on the use of mortar; or mechanical, that is, depending for its strength on the proper cutting of the stones, and bedding them one upon another. The masonry of the bridge above mentioned is of the cementitious kind, and good mortar must have been used. Were Roman cement employed with rubblestone instead of common mortar, we have no doubt that arches of much larger span than 76 ft. might be built of rubblestone. Indeed, as it has been proved that concrete will bear an immense weight, we see no reason why an arch should not be composed of that material in all situations where it might be found cheaper than any other. We should be glad to hear of something of the kind being tried; a dome roof, for example. — *Cond.*

IRELAND.

Cathedral of Armagh. — The Lord Primate of Ireland (Lord John Beresford, Archbishop of Armagh) has subscribed 8000*l.* to the restoration of the ancient cathedral of Armagh; the foundation stone of which was laid by the

Very Rev. the Dean, on the 21st of June last. The vast superstructure of the venerable tower, weighing 4000 tons, is to be supported, during the relaying of the foundation of the piers, without removing a single stone from the upper part of this immense tower, by means of some very ingenious mechanism invented by Mr. Cottingham, the architect. (*Newspaper.*) We should be much obliged to Mr. Cottingham for some account of the mechanism alluded to. — *Cond.*

Art. IV. *Retrospective Criticism.*

Mr. Edward Blore, architect to the late additions at Lambeth Palace and Buckingham Palace, designed the mansion for Lord Corehouse not Mr. Blair, as you have stated in p. 212. The house in question is beautifully situated on the Corehouse falls of the Clyde, and is a happy adaptation of the early English style of architecture to the requirements of the present day. The grounds, which are highly picturesque and romantic, commanding from their heights most extensive views over the beautiful vales of Clyde, combine with the house to render this one of the most tasteful retreats in this part of Scotland. — *A Subscriber. July*, 1834.

Mr. Main informs us that he only laid out a flower-garden and designed a green-house at this seat, and not the grounds generally, as we had supposed when we wrote the paragraph in p. 212.

Regarding the Performance of my equalising Ventilator, I beg to remind Mr. Dymond that the increase of heat, which he notices in p. 213., also increases the velocity of ventilation; and that the force of the current closes the door of the ventilator only so far as to admit the same quantity of air to escape in any given time, whether there are "four" or nine persons in the room; and that, therefore, his position, that the "change of the air in the room goes on less rapidly," is not correct; and that, in order to ventilate sufficiently his additional "five" visiters, he has only to shift the weight upon its lever, at hand in the room or in the vestibule, as directed in my description.

But it may be said that this attention to the lever and weight would be troublesome, and likely to be forgotten; and so it would, were it necessary to make an adjustment of the opening of the ventilator, as often as "four" or "five" persons joined or left a company. That, however, is a case which is not likely ever to occur. We are not to suppose that "four" persons are so cooped up in a room, where ventilation is so nearly adjusted to what they require, that the introduction of a few more visiters would bring the whole company to the expiring point. On the contrary, we must always ventilate freely, in such a way as that a little more heat may not be offensive. But, even supposing that such a degree of nicety of the rate of ventilation were contended for, it could be obtained neither by a mere opening in the roof, nor by opening and shutting a window; which, although it were practicable, and attended with no injurious consequences, could not be so easily done, as to adjust the weight upon the lever of my ventilator. Indeed, independently of the impossibility of effecting even an equality of the rate of change of the air, by opening a window, it is admitted by Mr. Dymond that, in summer, "the night air is frequently charged with an unhealthful degree of moisture:" and for this reason I object to his plan of ventilating sleeping-rooms, by keeping the windows open all night.

On the supposition that the bedrooms are the higher parts of the house, I would advise air to be taken in, in summer at least, at the base of the house. In winter I would keep the bedrooms comfortably warm by heated water, or by fire, and the windows shut: I would make the ventilator at the highest part of the room; carry its passage to the highest point possible, either in a chimney or in a tube; intercept the passage with an equalising ventilator; and keep the door of the bedroom a little open. By such an arrangement, the room would be purified at least from the light azotic gas expired by the

sleepers, by its ascending through the ventilator; and complete control might also be exercised over its exit; and, of course, over the entrance of a fresh supply of air; while, at the same time, the other pernicious part of the expired air, the carbonic acid gas, which is 22 per cent of the air breathed, being much heavier than common air, will rush out at the door of the room like water, whenever its temperature shall become at any time so low as to prevent its escape by the ventilator. Moreover, the fresh supply of air, entering at the base of the house, will gradually lose its "moisture" by the absorbing quality of the walls, &c. That such is the fact, Mr. Dymond may satisfy himself by using a hygrometer at the place where the moist air enters, and another in his bedrooms.

I am not, however, to be understood as signifying that the constitution and habits of some persons may not admit of ventilation effected in the way recommended by Mr. Dymond. We know that the aboriginal inhabitants of the warmest parts of America sleep in hammocks, suspended from a tree, and in open sheds, where they are nightly covered with dew, which to them is harmless, but to a European destructive. The celebrated Franklin also slept continually with his windows open; but his constitution was naturally robust, and he observed such a regimen of diet, drink, and exercise, as few persons would willingly confine themselves to. Indeed, such examples are far from warranting the practice, under a climate so variable as ours.

In conclusion, I beg to state that the weight which I propose (p. 68.) for regulating the opening of the suspended damper may be made sufficiently heavy to counterpoise it; and that thereby the proposed counterpoising weight attached, in fig. 28., to the lower margin of the external door, would be unnecessary, and that equality of ventilation could still be nearly obtained by changing the position of the weight upon its lever. I would observe, also, that the internal air passages, marked *m*, *n*, *p*, fig. 26., which permit the air to get above the suspended damper, should be made large; and in such a way as that they may not be closed by it, even when it is pushed up by hand, so far as to close the external door altogether.

From this arrangement, Mr. Dymond will see that, according as the external door becomes shut, the air between it and the suspended damper becomes compressed, and, reacting upon the upper side of the damper, prevents its ascent, and thus keeps the external door from being ever shut, farther than to allow an escape of air equal at all times, whatever pressure may be applied. In p. 69., for "scale," read "state" of the barometer; and in p. 70. for "777" read "177."—*John Milne, Edinburgh. 8. James's Square, July*, 1834.

Art. V. *Queries and Answers.*

Windows. — Should not the lower edge of windows be rather farther from the floor than the height of the chair backs, to prevent the shutters from constantly knocking against them? I know many persons prefer windows reaching to the ground; but I doubt whether they can be defended on optical principles, I mean with reference to the internal effect: but let the oculist and artist settle that. Let the former say whether a strong light, reflected up to the eye, is good; and the latter decide whether it does not confound the direct and reflected lights and their shadows. It is a point worth consideration, if we are to act from reason, and not from custom, or mere fashion. I should be glad to hear the opinions of some of your readers on this subject.—*T. W. Yorkshire, Jan.* 1833.

Cements. — Which is the best of all the different cements sold in London? I think there are at least half a dozen kinds? — *Juvenis. Birmingham, July*, 1834.